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The mixed blessing of a deregulatory endpoint for the public switched telephone network

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ABSTRACT

Receiving authority to dismantle the wireline public switched telephone network (PSTN) will deliver a mixture of financial benefits and costs to incumbent carriers and also jeopardize longstanding legislative and regulatory goals seeking ubiquitous, affordable and fully interconnected networks. Even if incumbent carriers continue to provide basic telephone services via wireless facilities, they will benefit from substantial relaxation of common carriage duties, no longer having to serve as the carrier of last resort and having the opportunity to decide whether and where to provide service. On the other hand, incumbent carriers may have underestimated the substantial financial and marketplace advantages they also will likely lose in the deregulatory process. Legislators and policy makers also may have underestimated the impact of no longer having the ability to impose common carrier mandates that require carriers to interconnect so that end users have complete access to network services regardless of location.

This paper will identify the potential problems resulting from prospective decisions by National Regulatory Authorities (NRAs), such as the United States Federal Communications Commission (FCC), to grant authority for telecommunications service providers to discontinue PSTN services. The paper also will consider whether in the absence of common carrier duties, private carriers providing telephone services, including Voice over the Internet Protocol (VoIP), voluntarily will agree to interconnect their networks. The paper will examine three recent carrier interconnection issues with an eye toward assessing whether a largely unregulated marketplace will create incentives for carriers to interconnect networks so that consumers will have ubiquitous access to PSTN replacement and other broadband services.

The paper concludes that private carrier interconnection models and information service regulatory oversight may not solve all disputes, or promote universal service public policy goals. Recent Internet interconnection and television program carriage disputes involving major players such as Comcast, Level 3, Fox, Cablevision and Google point to the possibility of increasingly contentious negotiations that could result in balkanized telecommunications networks with at least temporary blockages to desired content and services by some consumers.

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1. Introduction

Receiving authority to dismantle the long serving wireline public switched telephone network (PSTN) will deliver a mixture of clearly identifiable benefits, but also underappreciated costs to incumbent carriers.¹ Additionally such authorization will validate a major shift in the scope and reach of government oversight even for basic telecommunications services such as voice telephone service. Regulation will shift from the traditional common carrier model, which requires mandatory interconnection and affirmative efforts to ensure consumers with universal network access,² to a private carrier model where market forces drive carrier decisions whether to interconnect with other carriers and what array of services to offer consumers.

In the short run incumbent carriers, particularly ones providing wireline dial up telephone service, will accrue financial and operational gains from the likely substantial relaxation or elimination of traditional common carriage duties. They anticipate reducing operating costs, including reduction in the substantial number of personnel needed to maintain increasingly obsolete local loops that physically link each and every subscriber via a dedicated copper wire. Managers of these carriers appear to anticipate that even if they opt to offer substitute basic telephone services via wireless facilities and the Internet, traditional common carrier regulation can no longer apply. Because they no longer will offer preexisting (legacy) telecommunications services via installed copper wire lines, incumbent carriers will not have to serve as the carrier of last resort compelled to provide service on nondiscriminatory terms and conditions.³ As discussed in this paper, if obligated to make an explicit classification of any remaining voice telephone services, the Federal Communications Commission (FCC) and other National Regulatory Authorities (NRAs)⁴ would have to apply an unregulated service category,⁵ because software, riding on top of an unregulated broadband link, will serve as the primary future means for making and receiving telephone calls (FCC, 2002). For example, the FCC classified the underlying broadband traffic delivery medium as an information service, for example, cable modem and digital subscriber line service (DSL). It makes no sense to conclude that voice telephone software enhancements to these information services somehow converts everything back to common carrier telecommunications services.

Notwithstanding the significant benefits in qualifying for eliminated or reduced regulation, incumbent carriers may have underestimated the substantial financial and marketplace advantages they will lose in the deregulatory process. Legislators and regulators also appear confident that marketplace forces will replace regulatory mandates and provide adequate incentives for carriers to maintain all existing network interconnections that collectively provide consumers with ubiquitous access. The possibility exists that absent a common carrier mandate carriers may begin to terminate interconnection agreements, or diversify the terms and conditions for such interconnection much like what has occurred with Internet connections. While voluntary arrangements may substitute for regulator-mandated interconnection, cost averaging and universal service subsidies may not be available to ensure that subscribers in high cost areas will enjoy the same types of network access, often provided at below cost rates. While adopting an Internet type model of carrier interconnection and consumer access will promote efficiency, it may compromise or defeat long standing goals designed to achieve parity of cost and access between end users located in high cost, mostly rural locales and their urban counterparts.

Incumbent carriers often obscure or dismiss as insignificant the substantial privileges and benefits accruing from their current status as telecommunications service providers. Common carrier responsibilities include duties to interconnect with other carriers, provide service on transparent and nondiscriminatory terms and offer some low margin services (Cherry, 2008; Nachbar, 2008; Noam, 1994).⁶ But this legal status also guarantees United States wireline and some wireless carriers access to

¹ To discontinue a regulated telecommunications service in the United States, a carrier must file a petition with the Federal Communications Commission pursuant to Sec. 214 of the Communications Act of 1934, as amended. 47 U.S.C. §214 (2010). Telecommunications service is defined as “the transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received.” 47 U.S.C. §153(43).

² Title II, of the Communications Act, 47 U.S.C. §201–276, imposes many regulatory requirements including the duties to provide service on a transparent and nondiscriminatory manner. A common carrier “hold[s] oneself out indiscriminately to the clientele one is suited to serve”. Nat’l Ass’n of Regulatory Util. Comm’rs v. FCC, 525 F.2d 630, 641 (D.C. Cir. 1976). See also FCC v. Midwest Video Corp., 440 U.S. 689 (1979) (distinguishing between common carrier access requirements and mandatory carriage of local broadcast television signals by cable television operators).

³ The Communications Act, specifies that a “telecommunications carrier shall be treated as a common carrier under this chapter only to the extent that it is engaged in providing telecommunications services.” 47 U.S.C. §153(44).

⁴ This paper examines the FCC and United States case studies, because incumbent carriers in this country have begun to sell off wireline properties in rural locales and have sought legislation that would make it easier to avoid carrier of last resort responsibilities. While these actions may constitute the first wave, so far carriers in other nations have not undertaken similar campaigns.

⁵ Information service is defined as “the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.” 47 U.S.C. §153(20). “Information-service providers, by contrast, are not subject to mandatory common-carrier regulation under Title II, though the Commission has jurisdiction to impose additional regulatory obligations under its Title I ancillary jurisdiction to regulate interstate and foreign communications.” National Cable & Telecomm. Ass’n. v. Brand X Internet Serv., 545 U.S. 967, 976, 125 S.Ct. 2688, 2696 (2005). “The Act’s definitions, however, parallel the definitions of enhanced and basic service, not the facilities-based grounds on which that policy choice was based, and the Commission remains free to impose special regulatory duties on facilities-based ISPs under its Title I ancillary jurisdiction. In fact, it has invited comment on whether it can and should do so.” at the same place 545 U.S. at 996, 125 S.Ct. at 2708.

⁶ Telecommunications service providers carriers have “[t]he duty to provide, to any requesting telecommunications carrier for the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory in accordance with the terms and conditions of the agreement and the requirements of this

billions of dollars in annual universal service funding, (Universal Service Administrative Co., 2010)⁷ zero or low cost access to rights of way (FCC, 2011; FCC, 2009a; Snyder & Fitzsimmons, 2011) and radio spectrum, (Berresford, 1996)⁸ accelerated depreciation and other tax benefits, (Whitt, 2009)⁹ the ability to vertically integrate throughout the food chain of telecommunications services¹⁰ and leadership in the management of telephone numbers, standard setting and other policy issues.

Incumbents will strive to capture deregulatory benefits while retaining the many benefits previously reserved for common carriers. However, in the worst case scenario these legacy carriers will qualify for the same treatment as carriers providing Voice over the Internet Protocol (VoIP) service, the real-time carriage and delivery of data packets. VoIP services range in quality, reliability, price and the ability to link both computers and ordinary telephone handsets. (Spradley & Stoddard, 2003; Cooper & Koukoutchos, 2008). VoIP carriers enjoy none of the privileges of common carriers even as the FCC has imposed significant regulatory burdens previously reserved only for such carriers (FCC, 2005; FCC, 2006a; FCC, 2007).

This paper will identify the potential problems resulting from prospective decisions by NRAs, such as the FCC, to grant authority for telecommunications service providers to discontinue PSTN services. The paper also will consider whether in the absence of common carrier duties, carriers providing telephone services, including VoIP, voluntarily will agree to interconnect their networks. The paper will examine Internet peering and other types of network interconnection with an eye toward assessing whether a largely unregulated marketplace can ensure ubiquitous and affordable access to PSTN replacement services.

The paper concludes that NRAs could decide to treat all legacy telephone companies as information service providers free of common carrier burdens, but no longer entitled to common carrier benefits. Having decided that it lacks direct statutory authority, pursuant to Title II of the Communications Act of 1934, as amended, to impose any common carrier burdens or to offer any benefits, the FCC will have to rely on often questionable ancillary jurisdiction inferred from language in Title I of the Communications Act¹¹ if it wants to continue applying regulatory burdens and benefits to incumbent carriers. While reviewing courts have supported the FCC's imposition of interconnection and other common carrier responsibilities on VoIP carriers, the Commission has failed to stretch its jurisdictional wingspan to impose even narrow and well-calibrated oversight of information service providers. With no direct statutory authority, the FCC may lack jurisdiction to resolve any interconnection disputes between VoIP providers and other carriers offering voice telephone service, nor might the Commission have the authority to prevent price discrimination for functionally the same type of service.

Recent Internet carrier interconnection disputes may demonstrate that in the absence of compulsory interconnection carriers can reduce the scope and reach of network interconnection agreements while raising the cost of consumers' access. Comcast and Level 3 engaged in a high profile dispute over interconnection compensation when Level 3 became the primary national distributor of Netflix video content. For added leverage in negotiations with the Cablevision cable television operator the Fox broadcasting network blocked Cablevision subscribers from accessing content available to anyone else via the Hulu Internet site. The FCC has received complaints that the Google Voice service does not provide users access to any and all telephone numbers. These failures to reach timely agreements and disputes over basic commercial terms and conditions point to the possibility of increasingly contentious negotiations that could result in balkanized telecommunications networks with reversed or reduced progress in achieving universal service goals.

The paper also concludes that rural access to VoIP and other voice communications services could end up costing significantly more than what urban residents pay, an efficient, but politically risky outcome in nations where legislators from rural areas have disproportionate clout and consider telecommunications subsidies a priority (Regan, 2008).

(footnote continued)

section and section 252 of this title. An incumbent local exchange carrier shall provide such unbundled network elements in a manner that allows requesting carriers to combine such elements in order to provide such telecommunications service." 47 U.S.C. §251(c)(3) (2006).

⁷ In 2010, a total of \$7.95 billion in subsidies flowed from subscribers of local wireline and wireless service to local exchange carriers for providing service in high cost areas (\$4.27 billion) and lower priced service to low income subscribers (\$1.32 billion), rural health care providers (\$86 million) and schools/libraries (\$2.28 billion).

⁸ The FCC only recently has auctioned spectrum to the highest bidder. For most spectrum uses even today licenses are available without a direct payment. Local exchange carriers hold many licenses for terrestrial microwave radio transmitters that provide transmission links for local and long distance traffic, including the backhaul between cellular radio tower and a telephone company switching facility. "The historic excess of demand for spectrum may not connote a shortage as much as it reflects the fact that until recently the Commission gave spectrum away for free. When something is free, the demand for it will usually exceed the supply." (Berresford, 1996, p. 247).

⁹ "Direct Government financial support—in the form of subsidies, tax and depreciation incentives, and other instruments—is a third potential basis for common carriage duties and has been used over the years to aid the deployment of infrastructure. From this perspective, at least, no local communications network can be said to be completely private in nature. In any event, the power to impose regulation depends on the state's ability to condition the use of public resources." (Whitt, 2009, pp. 493–94).

¹⁰ Vertical integration refers to the combination of separate market activities by a single enterprise. See (FCC, 2006).

¹¹ Ancillary jurisdiction refers to an inference of statutory authority to impose rules and regulations based on indirect statutory authority. For example, the FCC asserted jurisdiction over cable television operators because the importation of distant broadcast television signals could have an adverse financial impact on directly regulated television broadcasters. *United States v. Sw. Cable Co.*, 392 U.S. 157, 178 (1968); *FCC v. Midwest Video Corp.* 440 U.S. 689, 696–709 (1979); *United States v. Midwest Video Corp.*, 406 U.S. 649, 659–70 (1972). (Werbach, 2010, p. 572).

2. The consequences of deregulation

Incumbent carriers in many nations persistently seek the elimination or relaxation of government regulation, including oversight of their legacy copper wire, dial up voice telephone calls commonly known as public switched telecommunications network (PSTN) service. Perhaps abandonment of PSTN service logically follows in a deregulatory glide path occasioned by technological innovations that make Internet broadband networking a single medium for all sorts of service, including voice communications. If one believes that ample broadband network competition exists, then industry self-regulation should suffice in lieu of government oversight, because a multiplicity of options available to both end users and Internet Service Providers (ISPs) should guarantee complete carrier interconnection. However, if one believes that ample competition does not exist, then deregulation has the potential for significant public harm, because end users may not have complete network access, or such access may become significantly more expensive for users in remote locales.

The impact of any reduction in interconnection and access will grow as carriers use technological innovation to combine services that previously traversed separate, stand alone networks (Werbach, 2007). The Internet has become a single medium for access to the entire information, communications and entertainment (ICE) ecosystem. In many nations wireline subscribers have cut the cord and embraced wireless options for both voice and broadband services.

Marketplace abuses that previously might impact just one segment of the ICE marketplace can adversely affect all market segments served by the carrier combining content and a broadband network and operating in a less than robustly competitive environment.

Technological and marketplace convergence makes it possible for a single broadband link to provide access to a variety of services. ICE carriers offer a bundle of services that combine audio and video content, like that available from broadcasters, satellite operators and cable television systems, as well as services that run the gamut from basic equivalents to common carrier telecommunications services, such as voice telephony, to the value added, advanced information services that configure software for customized applications delivered via basic telecommunications lines.

The FCC has evidenced a preference for applying the least intrusive regulatory classification for ventures that combine common carrier and information services (FCC, 2005a; *NCTA v. Brand X Internet Service*, 2005). The FCC treats all types of broadband Internet access as largely unregulated information services instead of a composite of regulated telecommunications services and unregulated information services. The Commission initially applied the composite model to DSL service, based on the rationale that when upgrading legacy copper wire lines for both voice and data service the separate common carrier telecommunications component did not evaporate. However, after the Supreme Court affirmed the FCC's determination that cable modem broadband access constituted an information service only, the Commission reclassified DSL as a single information service as well.

The predisposition to apply the least intrusive regulatory classification accrues public relations and political dividends with some stakeholders. It also supports the FCC's self-imposed obligation to create a bright line dichotomy even for convergent services that have characteristics representative of both basic telecommunications and enhanced information services (FCC, 2005a, p. 14,862 n. 32). When the FCC grants a petition for discontinuance of common carrier services, pursuant to Sec. 214 of the Communications Act, the Commission has to free the carrier of all, no longer applicable Title II common carrier responsibilities. Should the carrier replace the now discontinued service with something that provides a functional equivalent, for example VoIP; the FCC can neither reimpose explicit common carrier responsibilities, nor reinstate common carrier benefits, because the Commission assumes mutual exclusivity between common carrier telecommunications services and private carrier information services.

2.1. The information service deregulated safe harbor

When the FCC grants an incumbent carrier's petition for discontinuance of PSTN services, it will free the carrier of having to provide telecommunications services on a common carrier basis. Going forward the carrier may want to continue offering telephone services, without common carrier responsibilities. The purest, legally consistent and intellectually honest way to continue participating in the voice communications marketplace would be for both the carrier and the FCC to acknowledge that the carrier will offer information services which cannot trigger common carrier responsibilities and significant FCC regulatory intervention.

Unfortunately the FCC has not operated in a consistent and transparent manner in terms of maintaining a regulatory dichotomy between information services and telecommunications services. The Commission has avoided the issue for most VoIP services by refusing to state for the record into which category they fit. The Commission has refrained from making such a clear cut decision, because it wants VoIP subscribers to contribute to universal service funding and VoIP carriers to incur aspects of common carrier responsibilities. The Commission also wants to avoid having to classify VoIP as an information service, because this classification all but eliminates any direct statutory authority for the Commission to regulate, even to intervene in inter-carrier disputes over interconnection, or instances where the Commission should act to protect subscribers from harm.

The FCC has imposed significant regulatory burdens on VoIP service providers. VoIP carriers that can receive or deliver calls to conventional wired and wireless networks must contribute to universal service funding programs designed to promote affordable dial up telephone service (FCC, 2006a) make arrangements to support subscriber access to emergency

911 service (FCC, 2005) cooperate with law enforcement authorities (FCC, 2005b), incorporate the technical accommodations for persons with disabilities (FCC, 2007a; FCC, 2011a), such as deaf callers, support the ability of existing subscribers to keep their existing telephone numbers when switching services (FCC, 2007b; FCC, 2010) and report service outages to the Commission (FCC, 2012).

Bear in mind that many of these obligations impose significant costs on VoIP carriers, thereby reducing their ability to offer a cheaper alternative to existing wired and wireless services. VoIP arguably constitutes a type of information service, because users initiate and receive calls using software carried via broadband links that the FCC deems information services. However, the FCC has managed to avoid having to make that determination even as the Commission requires VoIP operators to incur many of the same obligations as borne by Title-II-regulated common carrier telephone companies (FCC, 2011b).

The FCC can impose consumer-oriented safeguards on VoIP service providers based on a persuasive and well articulated assertion of ancillary jurisdiction that an appellate court can accept. Because VoIP competes with conventional wired and wireless services subject to Title II regulation, the Commission can impose the very same requirements on VoIP carriers despite the lack of Title II authority (FCC, 1998). The FCC justifies its regulation of VoIP services that interconnect with the PSTN primarily on grounds that the service constitutes the functional equivalent of Title II regulated telephone service and therefore the need for regulatory parity justifies selective regulation of VoIP using the flexibility provided by Title I ancillary jurisdiction.

Reviewing courts have affirmed the Commission's jurisdiction as well as its preemption of the states from imposing a different regulatory regime, or none at all (*Vonage Holding Corp. v. Minn. Public Utilities Commission*, 2003). But success in selectively regulating VoIP service does not extend to other information services, such as broadband Internet access, because a less-direct impact on a regulated service exists and also because of the FCC's summary conclusion that all information services qualify for deregulation.

Notwithstanding its desire to avoid applying the information service classification to VoIP, the FCC initially wanted to confer that status on any carrier providing broadband access to the Internet. The Commission soon regretted having made such a broad sweeping determination, because it quickly learned that it subsequently lacked direct statutory authority to remedy clear instances of discriminatory and anticompetitive conduct by now unregulated broadband access providers, such as Comcast. The Commission failed to convince an appellate court that it had sufficient ancillary jurisdiction to sanction Comcast for meddling with the Internet traffic of subscribers without a compelling justification such as the need to manage its network (*Comcast Corp. v. FCC*, 2010). Comcast deliberately prevented subscribers from sharing files of content, not because such sharing would trigger network congestion, but arguably because Comcast might lose revenues in its video on demand delivery of similar or identical content.

The FCC lacked statutory authority to sanction Comcast, because previously the Commission had determined that the legislatively crafted information-service classification applies to Internet access provided via cable modems (FCC, 2002), DSL service (FCC, 2005a) the electrical power grid (FCC, 2006b) and wireless networks (FCC, 2007c). By declaring all forms of broadband Internet access to be information services, the Commission accrued short-term political dividends by showing restraint and favoring marketplace self-regulation. Based on its perceived need to make an either/or determination, the Commission opted for the less restrictive information-service classification based on the view that the telecommunications component needed to transmit bits and packets is so integrated with the content that the two become inseparable. By treating the telecommunications component as subordinate, the Commission could rationalize a semantic distinction between a carrier providing telecommunications, as a component to an information service, and one offering retail telecommunications services on a standalone basis. In opting to treat the telecommunications function as wholly integrated into an information service composite, the FCC could abandon conventional common carrier regulation required by Title II of the Communications Act, as was applied to DSL service before its reclassification as an information service (FCC, 2005a).

By avoiding the classification of VoIP and having failed to convince an appellate court that it had ancillary jurisdiction to remedy a subscriber access dispute with Comcast, the FCC has had to come up with ad hoc legal rationales for selective regulatory intervention. The FCC wrongly concluded that the broadband, Internet access marketplace was so competitive that no provider would try to engage in anticompetitive practices. In reality the broadband marketplace offers limited options to most U.S. consumers who have only two options providing both affordable rates and true broadband delivery speeds, namely one cable modem service provider and one DSL service provider (*Elliott & Settles*, 2010).

Despite having lost the argument whether it lawfully could impose open access requirements on ISPs, the FCC issued a Report and Order that imposes such requirements now characterized as fundamental public-interest obligations including four principles established in a 2005 Policy Statement (FCC, 2005c). The FCC requires ISPs to operate with transparency, nondiscrimination and a commitment not to block lawful traffic (FCC, 2010a) despite their status as private carriers offering information services. The Commission identified exceptions for reasonable network management, specialized services and wireless access. Notwithstanding its prior decision to apply the information-service classification that requires the FCC to eschew regulatory oversight, the Commission now emphasizes that its public interest duty to ensure an open Internet requires the establishment of clear and certain rules applicable to both fixed, that is wireline and mobile, that is wireless, service.

Having faced instances where it saw the need to intervene and resolve complaints about unfair and anticompetitive practices of a major national ISP, the FCC presented compelling arguments to reimpose public interest safeguards. But in concluding that retail ISPs operate as information service providers, the Commission acted on the assumption that an ISP

like Comcast would never engage in such practices. The FCC no longer concludes that consumers could punish such self-serving conduct by migrating to alternative carriers promising not to interfere with customers' broadband traffic (FCC, 2011b).

2.2. Incumbent carriers obscure the substantial financial and marketplace benefits available to common carriers

The upside benefits of incumbent carrier deregulation are well understood: with the reduction or elimination of government oversight, carriers have greater freedom to generate revenues and profits by concentrating on providing more expensive and higher margin services such as wireless and broadband. Additionally carriers no longer have to incur costs that reduce revenues and prevent efficiency gains including the duty to maintain both the PSTN and newer networks.

On the other hand, deregulated incumbents will incur new costs, or lose opportunities to avoid incurring costs as the FCC eliminates all or some of the benefits and preferences it has conferred over time. Whether by statutory mandate or on its own initiative, the FCC has lavished substantial privileges and entitlements to incumbent common carriers. These benefits translate into substantial additional revenues, cost and tax savings and insulation from competition. As common carriers, telecommunications service providers qualify for compulsory access to the facilities of other common carriers. The Telecommunications Act of 1996 clarified and expanded the nature and scope of this obligation on all common carriers, with additional requirements imposed on local exchange carriers, formerly affiliated with AT&T (FCC, 1999).

Incumbent local exchange carriers have received most of the financial subsidies earmarked for achieving universal service goals.¹² While the FCC strives to reform and revise the universal service mission (FCC, 2011d; FCC, 2012a) the Commission has relied on incumbent carriers to help shape policy and identify the cost of providing service. Similarly incumbent carriers have benefitted from priority access to rights of way and sites for transmission towers in terms of their early to market, first mover advantage, their status as the equivalent to a public utility with the right of eminent domain and the preferences available to them in the Telecommunications Act of 1996 (FCC, 2011; Snyder & Fitzsimmons, 2011).

Congress has conferred substantial tax benefits to incumbent carriers particularly in terms of accelerated depreciation of investment in physical plant. Incumbent carriers serve as the dominant players in advising the FCC on proposed changes in rules and in standard setting, including the administration of telephone numbers. More broadly incumbent carriers help the FCC frame law, policy and regulation. When they do not like how the FCC has acted, incumbent carriers readily litigate the matter and have deep pockets to retain experts whose sponsored research supports the incumbent carriers' reasoning (Frieden, 2010).

Incumbent carriers also can accrue operational and financial benefits, such as economies of scale and scope, through vertical and horizontal integration and by leveraging sunk investments in plant that can accrue both universal service subsidies and tax credits. Lax merger review and antitrust enforcement supports the accrual of market power. While obligated to compete for radio spectrum in recent years, incumbent carriers previously benefitted by having free spectrum authorized by the FCC. For example, the FCC created a wireline carrier radio spectrum set aside for incumbent carriers (FCC, 1982) thereby expediting their early market entry in the mobile telephone service market while other applicants had to compete for spectrum in costly and time consuming comparative hearings.

2.3. Incumbent carriers will strive to retain upside benefits

Having qualified for the elimination of common carrier status, incumbent carriers nevertheless will insist that they continue to qualify for all or some common carrier benefits. Without having to abandon their information service, private carrier status, incumbent carriers probably will suggest the need for an extensive transition to deregulation obligating the FCC and other NRAs to come up with a strategy that retains public interest safeguards by offering former common carrier benefits to ventures that volunteer to continue serving rural and high cost locales. However, the FCC will lack direct statutory authority to enforce safeguards and possibly even to monitor and remedy flaws in an incumbent carrier's voluntary service commitment. One can anticipate ongoing and possibly frequent disputes about the scope of a carrier's public interest commitments as well as the ability of an unregulated marketplace to ensure ubiquitous access to PSTN alternative services through voluntary interconnection agreements.

Incumbent carriers may achieve success in securing authority to discontinue wireline PSTN service based on the existence of one or more alternative service, such as VoIP via broadband lines and wireless broadband services. Even if these services are physically available in remote locales, the FCC would have to determine if they constitute complete functional equivalents to wireline service. Incumbents will argue in the affirmative noting that significant numbers of customers have used wireless service as a complete replacement for wireline service. A more nuanced analysis notes that carriers typically offer unmetered wireline service at rates significantly below metered wireless service.¹³ Also next

¹² In response to a Congressional query the FCC disclosed the top recipients of the Universal Service Fund subsidy for high cost service areas from 2008 to 2010: (1) Verizon Communications Inc.; (2) AT&T Inc.; (3) CenturyLink, Inc.; (4) Telephone and Data Systems, Inc.; (5) Alltel Corporation; (6) Windstream Corporation; (7) Frontier Communications Corporation; (8) Telapex, Inc.; (9) América Móvil; (10) Qwest Communications International, Inc.; (11) Sprint Nextel Corp.; (12) FairPoint Communications, Inc.; (13) Alaska Communications Systems Holdings, Inc.; (14) Embarq. (FCC, 2011c).

¹³ Wireless carriers in the United States have largely eliminated unlimited broadband service even as they raise rates for data services. "Unlimited data plans are going extinct, and users are wondering how they can avoid paying higher fees for their Web-surfing and Facebook-checking habits. In July, Verizon Wireless became the most recent carrier to switch from \$30-per-month "all you can eat" data pricing to tiered data pricing." (Geuss, 2011).

generation wireless networks capable of providing competitive alternatives to wireline broadband service will first arrive in densely populated urban areas with rural locales the last areas to get service, if ever.

3. Risks that an unregulated information service marketplace will not ensure ubiquitous access and voluntary interconnection

Whether classified as VoIP or a pure information service, incumbent carrier replacement voice telephone service will not trigger mandatory rights of interconnection. Perhaps the shared interest in network interconnection will promote ubiquitous subscriber access absent a mandate to do so. Voluntary interconnections in the Internet cloud (Robison, 2010) provide such access, and heretofore carriers have resolved threats of disconnection that would have deprived consumers of access to part of the content available via the Internet. However ISP interconnection disputes appear to have increased as evidenced by the case studies examined later in this paper. One cannot dismiss the potential for more disputes, particularly as the Internet matures and diversifies under lax or nonexistent regulatory oversight.

Carriers appear to have increased incentives to use interconnection and facilities access as leverage for extracting concessions and surcharges. Carriers will justify changed terms and conditions on grounds that they no longer can use a single rough justice interconnection model, because not all ISPs exchange the same volume of traffic (Yoo, 2010). ISPs have diversified in terms of the content they can make available, their customer base, the geographical reach of their networks, where they can interconnect with other networks and the bandwidth capacity they provide.

The Internet also has become a medium for an ever increasing array of services, including competitive alternatives to incumbent services such as dial up telephone service, broadcast, cable and satellite television and on demand access to movies. Because many incumbent ventures provide both broadband and legacy content services, they have both the ability and incentive to favor affiliated ventures. Put another way because broadband access can provide alternatives to incumbent services, incumbent carriers may use interconnection terms and conditions to create disincentives for consumers to migrate to new options.¹⁴

3.1. The level 3-comcast dispute

In late 2010 Comcast sought to impose a surcharge on traffic volumes generated by Level 3 in light of a significant increase in downstream traffic generated by Level 3 after having secured the opportunity to serve as the primary carrier for delivering Netflix full motion video content to subscribers. While Level 3 agreed to pay the surcharge, the company sought regulatory relief at the FCC (Level 3, 2010). Level 3 also launched a public relations campaign to frame the dispute in terms of Comcast imposing a toll booth on the Internet and singling out Level 3 and Netflix traffic for a surcharge to raise the cost of a major alternative to Comcast's pay per view movie services (Level 3, 2010a). Comcast responded with an equally forceful campaign to explain that the dispute simply addressed a commercial interconnection (peering) matter (Comcast Corp. 2010; Comcast Corp., 2010a). Comcast claimed that Level 3's increased traffic triggered the right to demand more compensation in light of the higher volume of traffic Comcast delivered to its subscribers.

This dispute provides a high profile example of how a dispute in one traffic routing segment can impact all other segments that combine to provide a complete link from content source to end users. Comcast correctly stated that Level 3 and it had executed a peering agreement for reciprocal and zero cost treatment of traffic, provided the flows remain nearly symmetrical. Because Level 3 now generates more traffic for Comcast to deliver than it receives from Comcast, the typical peering agreement would require Level 3 to compensate Comcast if the traffic flows cannot return to near parity. Unless the parties can find a way for Level 3 to receive more traffic from Comcast, Level 3 contractually bears a financial obligation to compensate Comcast.

On the other hand Level 3 correctly states that the peering agreement it has negotiated with Comcast cannot be examined in a vacuum, because this agreement covers only one component of a complete routing arrangement that involves more carriers, routing segments and opportunities for Comcast to generate revenues. Comcast generates hefty profits from its retail cable modem service subscriptions¹⁵ that offer access to Internet content without reserving the option to block, degrade or conditionally deliver traffic only if the content source, or an intermediary carrier agree to pay a surcharge. In other words, Comcast's unilateral actions to demand additional payment from an upstream peer may impact whether the company continues to satisfy all explicit or implicit service commitments established when Comcast contracts with retail subscribers to provide access to and from the Internet cloud. Surely Comcast's subscribers would not accept the premise that they only have a conditional right to receive timely delivery of Netflix streaming movie bits, if and only if an upstream carrier of those bits agrees to pay additional compensation to Comcast when traffic streams become unbalanced.

¹⁴ "Today, broadband providers have incentives to interfere with the operation of third-party Internet-based services that compete with the providers' revenue-generating telephony and/or pay-television services. . . . By interfering with the transmission of third parties' Internet-based services or raising the cost of online delivery for particular edge providers, telephone and cable companies can make those services less attractive to subscribers in comparison to their own offerings." (FCC 2010a) at 17916–18.

¹⁵ "Broadband is an extraordinarily profitable service. Top Wall Street analysts John Hodulik of UBS and Craig Moffett of Bernstein both report broadband margins of 90% based on official company filings." (DSL Prime, 2011).

What the Level 3-Comcast dispute addresses and which carrier makes the more persuasive argument depends on the geographical scope of analysis. If one solely examines the link between Level 3 and Comcast, then the matter looks like a peering dispute. Also if one interprets the subscription agreement between Comcast and retail subscribers as solely addressing the first and last links to the Internet cloud, then the matter does not necessarily factor in what subscribers expect their monthly Internet access payments to cover. But if the dispute examines both sides of the traffic Comcast handles, then the matter integrates what Comcast can properly demand from upstream sources of traffic and what the company must do with that traffic to meet its service commitments to downstream retail subscribers.

The emphasis on a regulatory dichotomy between telecommunications and information services prevents the FCC from having a direct statutory mandate to resolve interconnection disputes of Internet-based carriers, including ISPs and VoIP service providers:

The Comcast-Level 3 dispute thus highlights the sorts of questions the FCC would have to ask to develop appropriate policies for a converged broadband environment. The problem is not that these questions are challenging, but that they are not even on the table. Eight years or more of intensive debate about network neutrality at the FCC have not even touched the proper treatment of network-to-network relationships in the Internet backbone. Perhaps the FCC investigation of the dispute will spur a new effort to expand the scope of the open Internet proceeding, but that seems unlikely. The FCC has treated regulation of data networking as the exception, rather than the rule, for so long that it has become almost impossible for the agency to shift gears (Werbach, 2011, p. 1784).

3.2. The cablevision-fox dispute

At first impression one might not see any link between the Level 3-Comcast dispute and the one involving Cablevision and Fox. The latter began as a financial dispute over the level of compensation Cablevision should pay Fox for the right to deliver Fox's broadcast television content to Cablevision's cable television subscribers in New York (Kafka, 2010). This retransmission dispute added an Internet access element when Fox used techniques to identify traffic generated by Cablevision subscribers in the form of an upstream request for Fox content via the Hulu content aggregation web site. When Hulu forwarded to Fox the request to download Fox broadcast television content, Fox used techniques to identify content specific downloading requests initiated by Cablevision subscribers. Rather than process the content request forwarded to it by Hulu, Fox refused to deliver the content and instead sent a notification to the Cablevision broadband subscriber explaining the reason for denied access.

Cablevision subscribers, including ones only paying for Internet access, received a notification stating that because Cablevision currently had lost the right to retransmit Fox broadcast signals, Cablevision subscribers likewise lost the option to download portions of Fox broadcast content otherwise available to anyone else with a broadband connection to Hulu. Fox blocked traffic flows not at the last mile linking retail ISP and end user, but far upstream at the source. The company sought to maximize its negotiating leverage with Cablevision on the broadcast television carriage matter, by denying Cablevision subscribers the option of receiving portions of the now blocked content via an alternative method.

Fox and Comcast both resorted to tactics designed to enhance their negotiating leverage with a partner in the carriage of Internet delivered content. In the process, end users were denied access to something they believe they were entitled to receive, particularly in light of the fact that they continued to pay for the privilege through subscription fees for Internet access and cable television subscription fees during the dispute. In both instances one commercial venture could exploit a content bottleneck to deny access, either by blocking a request for a video file stored on a server the company controls, or by refusing to deliver that file to paying retail subscribers unless an intermediary carrier paid it a surcharge. Regardless of the merits in their disputes with a traffic routing partner both Comcast and Fox evidence an incentive and technical ability to distort, block and manipulate traffic flows to serve strategic goals. In both instances consumers are denied access to content as negotiating leverage to resolve a financial dispute in one company's favor. Likewise in both instances the FCC appears to lack statutory authority to craft a remedy.

3.3. Google voice

An unregulated private carrier ecosystem affects both carrier interconnection and consumer access. In the Level 3-Comcast and Cablevision-Fox disputes carrier interconnection issues had a direct impact on consumers triggering the prospect of delayed, inferior or even denied access to content. Such adverse consequences directly flow from the carriage dispute and the unilateral decision of a content provider (Fox) to block access, or to threaten blockage or degraded delivery of content (Comcast). The Google Voice case study provides an example of permanent or temporary blocked consumer access, not resulting from carrier disconnection, but two types of commercial judgments: (1) Google's decision not to provide service to specific telephone numbers, something a common carrier could not do; and (2) Apple's decision, later reversed, not to allow iPhone users to download and use a Google Voice application.

Google Voice is a free service that enables Internet users the opportunity to set up and manage telephone calls using conventional wired and wireless networks (Google, 2009). Google acquires long distance telephone minutes of use from FCC regulated telecommunications service providers, but claims that making such capacity available, using the Internet and a web-based software application to set up and manage calls, does not make it a common carrier (Google, 2009a).

Google decided that cost constraints justified its decision to deny access to a small number of telephone lines operated by rural telephone companies that charge significantly higher rates to complete calls (Google, 2009b). Such companies offer free conference calling and other inducements to stimulate in-bound calling that trigger the high interconnection charges.

AT&T wrote to the FCC objecting to Google's double standard on open access and its apparent violation of network neutrality policy (AT&T, 2009). However when Apple Computer decided not to allow iPhone users of AT&T's wireless network the opportunity to download an application to launch Google Voice, AT&T stated that it had no control over Apple's decision (FCC, 2009b).

The latitude with which Google and Apple make decisions about the accessibility and reach of Google Voice provides an example of the impact from market-driven decisions, free of government oversight. That impact ranges from significant, for example for rural telephone companies keen on pumping up inbound traffic and revenues, to nonexistent, for example for the vast majority of consumers making telephone calls via services other than Google Voice. In light of more than adequate long distance telephone service competition, decisions by Google and Apple to limit the availability of Google Voice have no significantly adverse effect on the marketplace, including the market for service to users in rural and high cost areas. Arguably no common carrier regulation should occur, not only because Google can make a compelling argument that it does not offer a telecommunications service, but also because the marketplace does not fail to satisfy public policy goals that used to require government attention, for example averaging the cost of telephone service generally and subsidizing service to high cost areas.

The FCC evidenced proper regulatory restraint by refraining from doing anything more than investigating how Google Voice works and why Apple would deny iPhone users access to the service. The Commission successfully avoided having to intervene in each of the three case studies examined here perhaps providing some confidence in the conclusion that in most instances private carriers can resolve disputes through commercial negotiations without regulatory intrusion. However it does not take much imagination to identify instances where the FCC might consider it necessary to intervene, despite clear evidence that the Commission lacks statutory authority to act.

3.4. Questionable jurisdiction for the FCC to mandate interconnection solutions

The carrier interconnection and consumer access disputes summarized above provide examples where high stakes and perceived marketplace advantages create incentives for ventures not to cooperate even when interconnection generates revenues and enhances the overall welfare of both the disputing parties and consumers. In the Level 3-Comcast dispute the FCC surely cannot assume it has direct or even indirect statutory authority if the two disputing parties both qualify as ISPs. In the Fox-Cablevision dispute, the FCC can identify a direct statutory link to regulate cable television operators, but on this particular matter Congress directed the Commission to eschew involvement and to rely on the ventures' shared commercial interests to achieve a mutually acceptable content carriage agreement (FCC, 2011e). In the Google Voice disputes the FCC would have to bear a high burden to justify its decision to regulate a handset manufacturer and reverse its decision not to provide access to third party software, nor could the Commission treat Google as a regulated telecommunications service provider.

The arguments against FCC regulation emphasize the assumption that any Internet access service wherever situated constitutes an information service. Additionally the FCC prefers to refrain from intervening in Internet disputes, and the D.C. Circuit Court of Appeals in *Comcast v. FCC*, confirmed that the Commission lacks direct statutory authority and cannot stretch ancillary authority even to remedy anticompetitive practices of ISPs. The global application of the information service classification surely would make legally questionable just about any FCC attempt to regulate the Internet, regardless of noble intentions.

Stopping the FCC from intervening requires confirmation that no telecommunications service element exists for any of the links between end users and their retail ISP, between the retail ISP and other upstream ISPs and between retail ISPs and ventures that lease telecommunications lines used for both Internet traffic and other types of traffic. The FCC recognizes that telecommunications – as opposed to telecommunications services – does constitute a component in the delivery of Internet traffic. However the Commission considers the telecommunications aspects of Internet access to end users as so integrated with information services as to become subordinate and unseverable (Frieden, 2006).

Notwithstanding its prior determination that created an absolute dichotomy between telecommunications services and information services, the FCC subsequently has sought to find ways to blur the categories. After its rebuke from the D.C. Circuit Court of Appeals in the *Comcast* case, the FCC reconsidered the regulatory classification of what it now termed the Broadband Internet Access Transmission Component, that is the telecommunications elements heretofore deemed to be integrated within an information service. The Commission directed its attention to the first broadband link from retail subscriber to an ISP.

The FCC has renewed its efforts to find a direct statutory basis for limited regulatory intervention should the operators of the telecommunications segment of an information service engage in anticompetitive practices. The Commission again may fail to uncover the needed statutory authority. If it were to fail again then arguably the information service classification should apply – if it does not already – throughout the Internet cloud, including links upstream from the retail ISP serving end users. Because the Commission explicitly decided not to use its ancillary jurisdiction to impose regulatory safeguards in the Wireline Internet Access Report and Order (FCC, 2005c) direct statutory authority to regulate would occur if and only if an ISP or carrier providing telecommunications lines to an ISP opted to designate some or all of its

offerings as a telecommunications service. In other words, the basis for FCC regulatory intervention would exist only if one or more carriers “voluntarily undertakes to provide . . . a telecommunications service,” (FCC, 2005a, p. 14910) because the Commission expressly declined to compel “the offering of a telecommunications service to ISPs” (FCC, 2005a, p. 14910).

ISPs have managed to achieve global connectivity through commercial peering and transit arrangements free of government intrusion. With rare exception, ISPs voluntarily have entered into these interconnection arrangements and have managed to resolve disputes without government intervention and with only rare instances of service disruptions. In light of apparently effective industry self-regulation, the FCC wisely has shown restraint when addressing claims of Internet market failure.

ISPs have demonstrated the ability to resolve disputes without the need for government intervention, in part because ample alternative routing opportunities exist upstream from the retail ISP. Because the Level 3-Comcast and Cablevision-Fox disputes address routing elements upstream from the retail ISP, traffic routing irregularities are not exacerbated by the lack of alternative routing options. Actual or threatened traffic blockage results from the lack of competition downstream at the retail ISP level, or by the fact that blockage occurred as a result of actions taken by a content source and not by any ISP participating in the routing of such content downstream.

Narrowing the focus of the Level 3-Comcast dispute solely to the transmission link between the two carriers, one can assert that a predictable event has triggered the need for a commercial adjustment to a preexisting contract. A significant increase in downstream traffic, not offset by a commensurate increase in upstream traffic results in an imbalance of traffic. When traffic streams become asymmetrical in a peering agreement the carrier generating more traffic bears financial responsibility to compensate the carrier now handling the higher traffic volume. Comcast's imposition of a financial surcharge appears to be a reasonable and nondiscriminatory response to changed circumstances. Had the routing imbalance occurred the other way, with Comcast generating more traffic than it receives from Level 3, Comcast would have incurred a higher financial burden.

The likelihood of asymmetrical traffic flows between carriers otherwise interested in serving as peers has promoted the parties to negotiate variations to the peering model. Paid peering involves an arrangement between two ISPs that handle traffic in both directions, but expect a traffic imbalance. If an ISP's business plan focuses on becoming a Content Distribution Network (CDN) for the delivery of streaming video to end users, that type of ISP is certain to generate more downstream traffic than it will receive upstream. CDNs do not balk at the obligation of compensating ISPs that deliver traffic downstream.

Level 3's agreement to handle Netflix downstream traffic triggered the traffic imbalance. Level 3 presumably negotiated an agreement that compensates the carrier for the predictable payments it would have to make when its now higher downstream traffic volume results in an imbalance. When Netflix opts to send movie compact disks via conventional postal mail, the company surely expects to compensate the postal service. So too should Netflix and its Internet carrier bear the financial obligation to compensate participating carriers downstream.

On the other hand, it would not take great imagination or creativity to come up with a scenario where an interconnection dispute becomes protracted and harmful to consumers. Video content sources, like Fox, may deliberately stall retransmission consent negotiations particularly if consumers cannot access an upcoming must see television event. ISPs affiliated with content sources, for example Comcast, might act on their ability and incentive to degrade the traffic of competitors, for example Netflix, to tilt the competitive playing field in favor of alternatives provided by an ISP corporate affiliate. Worse yet, when such service degradation occurs consumers cannot easily determine the cause and might blame the content source for the deliberate harm caused by the retail ISP. Also manufacturers of wireless handsets, with or without participation by wireless carriers, can inject software that prevents owners from accessing content, software and applications for which they have a lawful right to access in light of FCC's, 2005 Internet Policy statement and the Commission's longstanding *Carterfone* policy that supports consumers' right to attach devices and arguably software that causes no network harm (Frieden, 2008; Frieden, 2009).

3.5. The lack of an antitrust/competition policy remedy

Appellate courts in the United States have determined that they will not apply an antitrust duty to deal between carriers operating in a sufficiently competitive marketplace as determined by the FCC (*Verizon v. Law Offices of Curtis V. Trinko*, 2004). The Supreme Court generally defers to the FCC's expertise in determining whether and when to intervene. The Court also decided that if the FCC allows an incumbent carrier to offer end users lower rates than what it charges competitors it will not second guess the Commission (*Pacific Bell Telephone Company v. Linkline Communications, Inc.*, 2009). The Court assumed that an incumbent wireline carrier, Pacific Bell, had no antitrust duty to deal with any ISPs based on the FCC's premise that ample facilities-based competition existed. But for a voluntary concession to secure the FCC's approval of AT&T's acquisition of another ILEC, the Court noted that Pacific Bell would not have a duty even to provide ISPs with wholesale service.

The *Trinko* and *Linkline* cases evidence a strong reluctance on the part of the Supreme Court to support any review over the pricing and interconnection strategies of carriers. Presumably the plaintiffs could have petitioned the FCC to review the broadband wholesale prices, but the Commission could have claimed that it had no jurisdiction to investigate because the DSL service at issue constituted an information service not subject to Title II pricing and nondiscrimination requirements. In light of the regulatory objectives contained in the '96 Act, which the Court deemed “much more ambitious than the antitrust laws,” (*Verizon v. Law Offices of Curtis V. Trinko*, 2004 at 415) more powerful safeguards against anticompetitive practices already exist. The Court opted not to second guess why the FCC refrained from using its lawful authority to remedy an obvious price squeeze.

4. Conclusions

It does not appear that the FCC can carve out a standalone telecommunications service element from previously classified information services used to provide broadband Internet access. Even if the Commission could do so, it also would have to refute assertions that continued commercial negotiations eventually would resolve interconnection disputes between Internet-based information service providers. The unlikely success in FCC reclassification and the likelihood of marketplace remedies work against the imposition of common carrier burdens on information service providers as well as the conferral of common carrier benefits.

Carriers that seek authority to discontinue PSTN service abandon both the costs and benefits of common carrier-delivered telecommunications services. Should these carriers provide substitutes, via broadband links, the information service classification should apply. Even if these services constitute VoIP, the FCC cannot resurrect common carriage status and the commensurate benefits and burdens that apply.

The FCC has learned the hard way that having attributed the information service classification to a type of service, it may not readily change that classification, particularly if it imposes greater regulatory burdens and expands the Commission's jurisdiction. Even if the FCC avoided the telecommunications service/information service dichotomy – as it has done for VoIP – it could not easily justify returning common carrier benefits to ventures that sought the complete elimination of common carrier responsibilities.

Accordingly the FCC will face another instance where having abandoned jurisdiction, whether based on statutory interpretation, or an assessment of current and future marketplace conditions, it cannot readily correct any miscalculation. Unless the unregulated PSTN-substitute marketplace evidences existing and sustainable future competition, the FCC may find that a flawed marketplace would benefit from surgical intervention that the Commission cannot undertake.

The potential exists for carriers to test just how far they can exploit their deregulated status. Rather than curb such behavior with appropriate sanctions the FCC could end up creating incentives for more aggressive and potentially anticompetitive behavior based on its inability to act. Under the certainty of the FCC's inability to act carriers having the incentive and ability to pursue strategies that would trigger sanctions had they remained common carriers. An ISP such as Comcast might continually reassess whether it should interconnect with other ISPs and what terms and conditions should apply. While such reassessment might represent timely and appropriate responses to changes in traffic volume and market penetration they might just as easily represent increasingly aggressive tactics to test just how far a venture can act without triggering litigation or scrutiny by agencies other than the FCC for anticompetitive and unfair trade practices.

Under a deregulatory safe harbor, created by their status as information service providers, ISPs may dismantle the interconnection and billing arrangements that applied in the telecommunications marketplace. While a migration to Internet-based charging and interconnection models could be appropriate, the potential exists for such a migration to trigger less success in achieving longstanding universal service and public interest goals including strategies to foster parity of access opportunities and cost of service between rural and urban residents and to prevent fragmentation of networks. If incumbent carriers do not have an ongoing opportunity to tap into universal service subsidies, then they likely will abandon voluntary efforts that adversely impact their profitability.¹⁶

Dismissing voice telephone service as nothing more than a software application presupposes that consumers have readily available and affordable opportunities to access broadband networks used to provide VoIP and other substitutes to PSTN services. If even rural residents have ample opportunities to choose from a number of competing wireline and wireless broadband providers, then network balkanization and disconnections probably will not occur, or will not harm consumers if they arise. However any miscalculation in the scope of broadband competition and its sustainability may result in a reduction in progress toward longstanding public interest service goals. A grand endorsement of marketplace resource allocation can become a costly and harmful confirmation that not all telecommunications markets can self-regulate simply because the service travels via the Internet.

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¹⁶ The possibility exists that incumbent carriers, which have sought authority to discontinue PSTN service, anticipate that they still will have opportunities to tap into portions of future universal service funding targeting broadband access goals, rather than narrowband dial up telephone service.

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